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# Lifestyle, Mental Health and Quality of Life Among Obese Women during COVID-19 Pandemic in DKI Jakarta

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**Abstract.** *Background:* Obesity prevalence has been steadily rising over the world, including in Indonesia, particularly in DKI Jakarta, which has the highest obesity prevalence. Meanwhile, the global COVID-19 epidemic has impacted everyday activity, lifestyle, and mental health, as well as being linked to weight increase. The COVID-19 outbreak and obesity do have a detrimental impact on life quality. To our knowledge, there have been very few studies that have looked at the association between lifestyle factors and mental health with HRQOL in DKI Jakarta and surrounding (Jabodetabek) during COVID-19 Pandemic. *Methods:* Due to the COVID-19 epidemic and social isolation, this study was undertaken as a cross-sectional study using an online survey was circulated via social media platforms. Participants were obese women aged 18–49 resides in Jabodetabek. Total 209 participants were included in this study. *Results:* Respondents with a <median HRQOL score in all categories had a lower food pattern score and a higher sleep pattern severity score, with a significant mean and median difference. We discovered that respondents with a severe mental health score have a greater risk of having < median score in all domains. (Physical Domain OR 3.48, CI95%: 1.88–6.45; Psychological Domain OR 24.9, CI95%: 11.05–56.1; Social Relationship Domain OR 6.13, CI95%: 3.14–11.98; Environment Domain OR 3.47, CI95%: 1.89–6.41).

**Keywords:** Nutrition · Obesity · Quality of Life · Lifestyle · Mental Health

## 1 Introduction

Obesity prevalence continues to rise year after year. Obesity prevalence has also increased in Indonesia, at least from 2007 to 2018. Obesity prevalence in the Indonesia was 10.5% in 2007. In 2013, the %age grew to 14.8%. According to 2018 figures, 21.8% of adults were obese [3]. Obesity affects 29.3% of women while just 14.5% of males are obese<sup>1</sup>. North Sulawesi has the highest prevalence of obesity in Indonesia (30.2%), while DKI

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Jakarta came in second (29.8%) [2]. Obesity prevalence was considerably greater in women (30.76%) than in males in Jakarta, according to a Puskesmas obesity evaluation (27.53%) [3].

It is established that a person's lifestyle, including their dietary habits, activity level, psychological health, sleeping patterns, and a number of other factors, may affect their level of obesity. In recent days, the COVID-19 epidemic has forced adjustments in many facets of life, including lifestyle and daily activity, all around the world. Self-quarantine results in people are compelled to spend more hours at home. Studies show that 20–30% of respondents who self-quarantine themselves end up gaining weight. Additionally, a higher percentage of respondents reported changing their sleep and exercise schedules, increasing their attachment to meat, dairy, and processed food, and consuming more in reaction to both sight and smell [4–7]. Other dangerous behaviours, such as smoking and drinking, have also increased [5]. Additionally, there was a connection between an increase in weight and self-reported anxiety, despair, and loneliness [6].

Obesity is linked to a number of chronic disorders, including sleep apnoea, type 2 diabetes, cancer, liver and intestinal issues, degenerative joint disease, and sexual dysfunction [7, 8]. Obesity is also linked to a negative body image, stigma, and low self-esteem, which can lead to feelings of melancholy, loneliness, depression, and anxiety [8, 9]. As a result, obesity has always been connected in a numerous ways to a worsening in health-related quality of life (HRQOL) [7–10]. On the other hand, it was discovered that the COVID-19 pandemic had a detrimental effect on people's HRQOL because of their demographics, mass unemployment, chronic health issues, decline in physical and other community work (such as everyday lives, recreation, social experience, and schooling), psychological disorders, as well as how individual's life was negatively effected from being affected to the COVID-19 [11–13]. As a result, being obese during the COVID-19 may raise the chances of having a poor HRQOL.

We are aware of a dearth of research that have examined the influences on obese women's health-related quality of life, notably during the COVID-19 pandemic. We performed a cross-sectional study to identify the behavior, mental wellbeing, and link to the life quality of obese women. This study used an online technique to recruit obese women aged 18 to 49 years old from DKI Jakarta province and its neighboring areas, including Bogor, Depok, Tangerang, and Bekasi (Jabodetabek), who have comparable characteristics and lifestyles as DKI Jakarta residents.

## 2 Methods

### 2.1 Research Design

This study, which used an online questionnaire as a cross-sectional methodology, was carried out because of the COVID-19 outbreak and social isolation. The questionnaire was distributed through the social platforms WhatsApp and Instagram using Limesurvey. We used Instagram account @qualitian to paid-promoting the research e-posters, segmenting Instagram users who were interested in many keywords: "obesity," "overweight," "diet," "weight management," "nutrition," "fitness," and "wellness." Through this account, we

were able to reach over 10.000 Instagram users. We also paid for promotion on Instagram accounts for nutrition education with over 10,000 followers, such as @gizipedia, @ahligiziid, and @dietisien.id. We also sent out personal messages via broadcast.

## 2.2 Participants

Participants were chosen for the study based on several criteria for inclusion and exclusion. The study's inclusion criteria were: (1) women aged 18 to 49, (2) residents of Jakarta, Bogor, Depok, Tangerang, and Bekasi, and (3) a BMI  $\geq 24.9$  kg/m<sup>2</sup>. We excluded participants who (1) were following an ongoing weight loss diet recommendation at the time of data collection, (2) were pregnant or breastfeeding, (3) were in menopause (12 months after their last period), or (4) did not completely fill out the survey form. People who agreed to participate in the research marked the approval checkbox on the questionnaire form's first section and then filled out the screening and survey forms. The data was gathered between September and October of 2021.

## 2.3 Sample Size Determination

Utilizing population sample calculation procedure, the needed number of respondents within the survey was determined to be a minimum of 165. We expected a 20% response rate because the sampling method we utilized was an online advertisement. As a result, the e-poster and notification must reach at least 825 people.

## 2.4 Measurement

### 2.4.1 Health Related Quality of Life

The 26 instruments of the WHOQOL (the World Health Organization – Quality of Life questionnaires) Bref edition are used to measure the four categories of overall fitness, mental well-being, social interactions, and the surroundings to determine one's health-related quality of life (HRQOL). Domain scores were scaled using positive scales (i.e. higher scores denote higher quality of life) [14]. According to WHOQOL recommendations, the cumulative score of each domain will be recoded to a 0–100 value and grouped into  $\geq$  Median and  $<$  Median score.

### 2.4.2 Dietary Pattern

Twelve items about diet are included in the self-administered online survey for the Stanford Wellness Living Laboratory, which are: fruits, vegetables, whole grains, beans or lentils, 100% fruit juice, sugar-sweetened drinks, processed meat, nuts and seeds, high-sodium processed meals, sweetened pastries or candies, and fish are just a few of the things that should be avoided. Additionally, they were asked how frequently they made meals at home and how frequently they ate fast food (such as McDonald's). The 0–10 score range is based on the frequency of consumption and the rating valence (negative/positive) [15].

### 2.4.3 Sleep Pattern

Using regular sleep cycles over the course of the preceding month, the Pittsburgh Sleep Quality Index (PSQI) was developed to assess sleeping patterns and quality. PSQI has 19 self-reported questionnaires together with 5 items that, if relevant, can be rated by a companion or bed mate. Only self-rated questions will be taken into account during scoring. The scores for the following seven categories—quality of sleep, deep sleep, sleeping habits, length of sleep, sleep problems, use of sleeping aids, and excessive daytime sleepiness from 0 to 3. A score of “3” indicates extremely tough, while a score of “0” indicates no difficulty. In order to obtain the set of data, which ranges from 0 to 21, the seven component scores are summed together [16].

### 2.4.4 Physical Activity

WHO created the Global Physical Activity Questionnaire, which consists of 16 items covering work, transit, and leisure time. The GPAQ score would be used to calculate Metabolic Equivalent (MET) [17].

### 2.4.5 Mental Health

To evaluate psychological responses including sadness, anxiety, and stress, we used a set of three self-report ratings known as the Depression, Anxiety, and Stress Scale 21 Items (DASS-21). There are seven items on all of the three DASS-21 scales, which are then divided into indicators with similar content. The depression scale rates many symptoms including dysphoria, despair, disempowerment of living, subconscious, loss of motivation or engagement, anhedonia, and lethargy. The anxiety scale measures contextual factors anxiety, muscle tissue effects, autonomic arousal, and the subjective experience of anxious emotion. Energy levels that are non-specific and have been there for a while might affect the response that occurs. It assessed problems falling asleep, anxiousness and attentiveness, as well as feelings of being easily irritated or angry, irritable or over-reacting, and impatient. To compute the final score for depression, anxiety, and stress, the total values for the relevant items were added together and multiplied by two. Severe is indicated with a score of 60 [18].

## 2.5 Statistical Analysis

Each independent variable was compared to the HRQOL domains using bivariate analysis. If the p-value is less than 0.05, the independent factor is linked to the dependent factor. The chi square or independent t-test statistic test was used for bivariate analysis.

## 2.6 Ethical Clearance

The Ethics Committee of the Faculty of Medicine, University of Indonesia - Cipto Mangunkusumo Hospital gave its clearance for the conduct of this study in accordance with established ethical standards.; (Protocol Number: 21-09-0922).

## 3 Results

### 3.1 The Study Population's Characteristics

We received 580 responses from Whatsapp and Instagram users who clicked the survey link. A total of 282 people completed the questionnaires, with approximately 209 of them meeting the survey's inclusion and exclusion criteria. Women aged 18–29 made up a bigger share of the responders (68.4%) than women of other ages. The majority of those who responded had completed their undergraduate studies (77%). In DKI Jakarta, however, there was a higher number of respondents with an income of less than 4.200.000 rupiah, or the minimum wage (56%). It was also shown that almost 60% of respondents are either employees or professionals, with 36.4% working in the private sector. During the COVID-19 Pandemic, almost 68.4% of respondents lost their jobs. The majority of those who responded live in Jakarta (45.5%). Based on their estimated weight and height at the time they filled out the survey, we considered obese women with a BMI of 24.9 kg/m<sup>2</sup>. The BMI ranged from 24.97 to 54.59, with 32.30 being the median .

### 3.2 Association of Lifestyle, Mental Health and HRQOL

Respondents with a <median HRQOL score in all categories had a lower food pattern score and a higher sleep pattern severity score, with a significant mean and median difference (see Table 1). We discovered that there is no statistical link between physical activity (PA) and any of the domains. Respondents with a high PA, on the other hand, have the best physical health presentation, with a median score, compared to those with a moderate or low PA (see Table 2).

We discovered that mental health had a strong relationship with all areas of HRQOL, as measured by total Depression, Anxiety, and Stress total scores. Respondents with a severe mental health score have a 3,5-fold higher risk of having a median score in the physical domain, a 25-fold higher risk of having a median score in the psychological domain, a 6-fold higher risk of having a median score in the interpersonal domain, and a nearly 3,5-fold higher risk of having a median score in the environment domain (OR 3.48, CI95%: 1.88–6.45; OR 24.9, CI95%: 11.05–56.1; OR 6.13, CI95%: 3.14–11.98; OR 3.47, CI95%: 1.89–6.41) (see Table 3).



**Table 1.** General charter tics (*N* = 209)

Variable		N(%)
<b>Demographic Characteristic</b>		
Age	18-29	143 (68.4%)
	30-39	49 (23.4%)
	40-49	17 (8.1%)
Education	High School	48 (23%)
	College	161 (77%)
Income	<4.200.000	117 (56%)
	≤4.200.000	92 (44%)
Occupation	Not Employed	23 (11%)
	Housewives	22 (10.5%)
	Government Employee	10 (4.8%)
	Private Employee	76 (36.4%)
	Student	32 (15.3%)
	Professionals	13 (6.2%)
	Entrepreneur/Freelancer	33 (15.8%)
Loss of Job Experience	Yes	117 (68.4%)
	No	92 (31.6%)
Area of Living	Jakarta	95 (45.5%)
	Bogor	22 (10.5%)
	Depok	25 (12%)
	Tangerang	26(12.4%)
	Bekasi	41 (19.6%)
<b>BMI</b>		<b>Median (Min-Max)</b>
		32.30 (24.97-54.69)

**Table 2.** Median Differences of Lifestyle Factors in HRQOL Domain

	Physical Health		Psyclogical		Social Relationship		Environment	
	≥Median	<Median	≥Median	<Median	≥Median	<Median	≥Median	<Median
Dietary Pattern	n = 139 60.97±16.28	n= 70 54.09±16.50	n = 123 62.06±16.28	n= 86 53.81±16.85	n = 107 62.34±16.48	n= 102 54.81±15.99	n = 116 61.24±16.94	n= 93 55.45±15.76
<i>p-value</i>	<b>0.004</b>		<b>0.000</b>		<b>0.001</b>		<b>0.012</b>	
Sleep Pattern <sup>m</sup>	7 (2-18)	9 (2-16)	7 (2-17)	10 (3-18)	7 (2-18)	9 (2-17)	7 (2-18)	9 (2-17)
<i>p-value</i>	<b>0.001</b>		<b>0.000</b>		<b>0.000</b>		<b>0.003</b>	

m) Mann-Whitney Test

Dietary pattern assessed with WELL's diet pattern questionnaire which higher score indicates better diet pattern. Sleep pattern assessed with Pittsburg Sleep Quality Index which higher score indicates severe sleep disturbance.

## 4 Discussions

The relationship between dietary pattern, sleep pattern, physical activity, mental health, and HRQOL among obese individuals in Jabodetabek is described in this study. Obese women with a lower dietary pattern, sleep pattern, and severe mental health score have

**Table 3.** Association Physical Activity and HRQOL Domains

Variable	Physical Health		p-value	OR	Psychology		p-value	OR	Social Relationship		p-value	OR	Environment		p-value	OR
	>Median	<Median			>Median	<Median			>Median	<Median			>Median	<Median		
<b>Physical Activity (GPAQ)</b>																
High Physical Activity (77.8%)	7	2 (22.2%)	0,4	1 (Ref)	4 (44.4%)	5 (55.6%)	0,67	1 (Ref)	4 (44.4%)	5 (55.6%)	0,50	1 (Ref)	4 (44.4%)	5 (55.6%)	0,77	1 (Ref)
Moderate Physical Activity (74.3%)	26	9 (25.7%)		1.21 (0.21 - 6.94)	21 (60.0%)	14 (40.0%)		0.53 (0.12 - 2.34)	21 (60.0%)	14 (40.0%)		0.53 (0.12 - 2.34)	19 (54.3%)	16 (45.7%)		0.67 (0.15 - 2.94)
Low Physical Activity	106	59 (55.8%)		1.95 (0.39 - 9.68)	98 (59.4%)	67 (40.6%)		0.55 (0.14 - 2.11)	82 (49.7%)	83 (50.3%)		0.81 (0.21 - 3.12)	93 (56.4%)	72 (43.6%)		0.62 (0.16 - 2.39)

a higher probability of having a poorer HRQOL score during COVID-19, according to the study's main findings.

Dietary pattern scores were found to be linked to all HRQOL components. In line with our findings, a study indicated that adults who eat a higher-quality diet, comply to national dietary guidelines, have greater HRQOL, general health with an extra link to emotional well-being in women [19]. The physical domain, as well as all domains, were found to be linked to sleep patterns. Respondents who scored higher than the median also had greater sleep quality, according to many studies [20, 21]. Apparently, we discovered that physical activity was not connected with all domains based on the GPAQ score. However, when compared to high PA (22.2%), a higher proportion of respondents scored median in medium PA (25.7%) and low PA (7.2%). (35.8%). This finding is consistent with a study that found that increasing physical exercise had a significant favorable impact on HRQOL [22].

Depression, anxiety, and stress (DAS) were substantially linked to all domains, with respondents with a higher DAS score having a higher domain score. Obesity and psychological well-being have a complicated relationship, according to a study, involving physical, social, and psychological aspects. Obesity reduces one's quality of life and raises the risk of mental illness; on the other hand, people with mental illness may become obese as a result of an unhealthy lifestyle or other biological reasons. As a result, prioritizing mental health over obesity has the potential to boost quality of life directly [23].

Our findings must be weighed against their advantages and disadvantages. One of the study's strengths is its uniqueness as the first study of its kind in Jabodetabek on the relationship between parameters linked to lifestyle and mental health and HRQOL among obese women within the researchers' knowledge. We utilized an online survey as a study instrument since it allowed us to collect samples from all of Jabodetabek's locations without raising the risk of coronavirus transmission. However, there are a few flaws in this study that need to be addressed. The first instance of information bias could have occurred during the data collection process. During the pandemic, recruitment was difficult because it couldn't be done face to face and had to be done through an internet survey where we couldn't be sure the respondent understood the question. However, we conducted a pre-testing to ensure the questionnaire's reliability and validity, as well as to obtain feedback from respondents and enhance the questionnaire. Second, because we were unable to physically test each respondent's BMI, we relied on their own estimates, which could lead to measurement bias.

For future studies, we recommend to have an explorative study for more factors and variables and with various participants to have a better perspective on this topic.

## 5 Conclusions

In a sample of 18-49-year-old obese women from Jabodetabek, those who reported improved food, sleep, and mental health also reported higher mental wellbeing life satisfaction across all subject areas, including physical, psychological, social connection, and surroundings. Further research will identify the main and contributing variables linked to the mental wellbeing life satisfaction of obese women. These findings highlight the significance of recognizing wellness life satisfaction as the impact of obesity and what variables connect to it in order to prevent declining overall health and wellbeing and quality of work in obese women.

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